obtained in the case of materials whose structure is different from a nanocrystalline structure.

However, a drawback of strip or ribbon having a nanocrystalline structure is that such strip or ribbon is very brittle so that the slightest mechanical stress results in the strip or ribbon fracturing. It is not even possible to handle the strip or ribbon having a nanocrystalline structure without taking very great precautions, because stresses, even very low stresses induced in the strip result in its undergoing brittle fracture. The only process known at the present time for manufacturing metal components such as magnetic cores from strip having a nanocrystalline structure consists in winding the strip of magnetic alloy in the amorphous state and then heat-treating this strip at a temperature at which the nanocrystalline structure develops. Optionally, the heat treatment may be carried out in a magnetic field in order to modify the hysteresis loop of these nanocrystalline alloys.

It is therefore not possible at the present time to manufacture nanocrystalline magnetic components by mechanical treatment or machining operations including, for example cutting.

It would be of very great interest to obtain magnetic components from strip made of a nanocrystalline magnetic alloy which have a profile whose geometrical shape is well defined. In particular, it would be extremely beneficial to be able to manufacture, from nanocrystalline strip, magnetic components having the shape of washers, U-or E-shapes or even components having complex shapes used for making clocks or watches.

More generally, it may be extremely beneficial to have a process allowing the treatment of a thin brittle metal strip, having a small thickness, generally less than 0.1 mm, the treatment of the strip involving at least one step in which the brittle strip is subjected to stresses, especially cutting or bending stresses.

It is therefore an object of the invention to provide a process for the treatment of at least one thin brittle metal strip having a thickness of less than 0.1 mm, comprising at least one step in which the thin strip is subjected to stresses, this process making it possible to avoid the risks of the brittle strip fracturing during its treatment and, in particular, to obtain components of precise and/or complex geometrical shape from the thin brittle strip.

For this purpose, prior to the step of the process in which the thin strip is subjected to stresses, at least one side of the strip is covered with a coating layer made of at least one polymer material so as to obtain, on the strip, an adhesive layer having a thickness of between 1 and 100 μm, modifying the deformation and fracture properties of the thin metal strip, and the step of the process in which the thin strip is subjected to stresses is carried out on the strip covered with the coating layer.

In order to make the invention clearly understood, the implementation of a process according to the invention, for the production of magnetic components by cutting them from a strip made of a nanocrystalline magnetic alloy will now be described, by way of example, with reference to the figures appended hereto.

Figure 1 is a schematic side view of a plant for implementing the process according to the invention and according to a first embodiment.

Figure 2 is a schematic side view of a plant for implementing the process according to the invention and according to a second embodiment.

Figures 3 and 4 are side views of plants for implementing two successive phases of a treatment process according to the invention and according to a third embodiment.

Figure 5 is a side view of a plant for implementing the process according to the invention and

according to a fourth embodiment.

Figures 6A, 6B and 6C are perspective views of transformer components obtained by a process according to the invention comprising a step of cutting a nanocrystalline thin magnetic strip.

Figures 7A, 7B and 7C are perspective views of toric magnetic cores obtained by a treatment process according to the invention comprising a cutting step.

Figure 8 is perspective view of a component of an electrical circuit obtained by a process for the treatment according to the invention of thin nanocrystalline strips.

Figures 9A, 9B and 9C are schematic views showing three successive phases in the implementation of a treatment process according to the invention comprising a chemical cutting step.

Figure 10 is a top view showing a number of components obtained by a process according to the invention involving chemical cutting.

Figures 11A, 11B, 11C, 11D and 11E are schematic views showing the successive phases in the implementation of the process of the invention and the manufacture of a transformer integrated or not integrated into a printed circuit.

The process according to the invention as will be described below is used for the manufacture of flat magnetic components made of a magnetic material in a nanocrystalline form.

The magnetic material is a soft magnetic material, generally consisting of an alloy containing mainly iron or, optionally, a mixture of iron and a ferromagnetic metal such as nickel and cobalt, together with copper, silicon, boron and a metal such as niobium.

The magnetic material may also contain iron, zirconium and boron and optionally copper and silicon.

The magnetic alloys to which the invention applies are therefore, for example, Fe-Cu-Nb-B-Si or Fe-Zr-(Cu)-B-(Si) alloys (the brackets around the